CLAIMS

What is claimed is:

1.   A method for configuring a prefetch buffer, comprising:

    receiving a read request from a master; and

5   in response to the read request, selectively modifying a line size

        of at least a portion of the prefetch buffer based on an

        attribute of the read request.

2.   The method of claim 1, wherein the attribute of the read request

10   comprises one of a master identifier corresponding to the master, a

    data size of the read request, and a burst length of the read request.

3.   The method of claim 2, wherein selectively modifying the line

    size is based on a second attribute of the read request, wherein the

15   second attribute comprises another one of the master identifier, the

    data size, and the burst length.

4.   The method of claim 1, wherein the read request results in a miss

    in the prefetch buffer.

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5.   The method of claim 1, wherein the prefetch buffer includes a

    plurality of lines, each of the plurality of lines having a

    corresponding one of status fields.

25 6.   The method of claim 5, further comprising:

    selecting at least a portion of the plurality of lines as a

        replacement entry within the prefetch buffer based on the

        status fields of the prefetch buffer.

7. The method of claim 6, wherein each of the status fields comprise an address tag field, an invalid field to indicate that a corresponding line in the prefetch buffer is not valid, a used field to indicate that a corresponding line in the prefetch buffer has been provided in response to a previous burst read request, and a valid field to indicate a corresponding line in the prefetch buffer has been provided in response to a previous non-burst read request.

8. The method of claim 6, wherein selectively modifying the line size comprises selectively modifying a line size of the replacement entry.

9. The method of claim 8, wherein selectively modifying the line size of the replacement entry comprises selectively modifying a status field corresponding to the replacement entry.

10. The method of claim 9, wherein selectively modifying the status field corresponding to the replacement entry is based on the attribute of the read request, the attribute comprising at least one of a data size and a burst length of the read request.

11. The method of claim 10, further comprising:

    determining a number of data requests to a memory addressed by the read request based on a bus width of a bus interfacing with the memory; and

determining a size of the data requests to the memory based on the data size corresponding to the read request and on the status field of the replacement entry.

5   12.   The method of claim 11, further comprising:

generating the data requests to the memory; and

storing data from the memory into the replacement entry of the prefetch buffer.

10   13.   The method of claim 10, further comprising:

generating at least one data request to a memory addressed by the read request; and

storing data from the memory into the replacement entry of the prefetch buffer.

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14.   A method for configuring a prefetch buffer, comprising:

receiving a read request to a memory from a requesting master, the read request having a corresponding data size and burst length;

20   providing a prefetch buffer reconfiguration indicator based on the data size and the burst length;

selecting a replacement entry within the prefetch buffer;

based on the prefetch buffer reconfiguration indicator, selectively modifying a line size of the replacement entry;

25   and

storing data fetched from the memory in the replacement entry.

15. The method of claim 14, wherein the prefetch buffer reconfiguration indicator is based on the data size, the burst length, and a master identifier corresponding to the requesting master.

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16. The method of claim 14, wherein selectively modifying the line size of the replacement entry comprises selectively modifying at least one status field corresponding to the replacement entry.

10   17. The method of claim 16, wherein the at least one status field comprises an address tag field, wherein selectively modifying the at least one status field comprises selectively modifying the address tag field.

15   18. The method of claim 14, wherein selecting the replacement entry within the prefetch buffer comprises checking at least one of valid, invalid, or used bits within status fields of the prefetch buffer.

20   19.   The method of claim 14, further comprising:
       generating at least one data fetch request to the memory, wherein the at least one data fetch request is based on a bus width corresponding to the memory.

25   20.   A data processing system, comprising:
       a master;
       a memory;

a prefetch buffer, coupled to the master and the memory, the

prefetch buffer having a plurality of lines; and

prefetch control circuitry coupled to the prefetch buffer, the

prefetch control circuitry, in response to a read request from

5   the master, selectively modifying a line size of at least a

portion of the prefetch buffer.

21. The data processing system of claim 20, wherein the prefetch

control circuitry selects a replacement entry within the prefetch

10   buffer, and selectively modifying the line size comprises

selectively modifying a line size of the replacement entry.

22. The data processing system of claim 21, wherein the prefetch

control circuitry receives a data size indicator and a burst length

15   indicator from the master and selectively modifies the line size of

the replacement entry based on the data size indicator and the

burst length indicator.

23. The data processing system of claim 20, wherein the prefetch

20   buffer comprises a plurality of lines and status fields, each of the

plurality of lines having a corresponding one of the status fields.

24. The data processing system of claim 23, wherein each of the status

fields comprise an address tag field, an invalid field to indicate

25   that a corresponding line in the prefetch buffer is not valid, a used

field to indicate that a corresponding line in the prefetch buffer

has been provided in response to a previous burst read request,

and a valid field to indicate a corresponding line in the prefetch

buffer has been provided in response to a previous non-burst read
request.